Defining Features and Functional Impact of Dysgraphia?

Mandy Nayton

DSF Literacy and Clinical Services

Some people there are who, being grown, forget the horrible task of learning to read. It is perhaps the greatest single effort that the human undertakes, and he must do it as a child… (it is) the reduction of experience to a set of symbols. For a thousand thousand years these humans have existed and they have only learned this trick – this magic – in the final ten thousand of the thousand thousand… I remember that words - written or printed – were devils, and books, because they gave me pain, were my enemies.

(Steinbeck, 1976)

Session Overview

- A quick history
- What is dysgraphia?
- Identifying and responding
  - Handwriting
  - Spelling
  - Written Expression
- Assistive technology
- Case examples

History

- Written symbol systems have existed for around 5,000 years
- Only recently did societies attempt to teach all their citizens to read and write
- Discovered some struggle more than others in learning written language

Α Β Γ Δ Ε Ζ Η Θ
Ι Κ Λ Μ Ν Ξ Ο Π
Ρ Σ Τ Υ Φ Χ Ψ Ω
α β γ δ ε ζ η θ ι κ λ μ
ν ξ ο π ρ σ τ υ φ χ ψ

History

- Early writing was used as meaning symbols
- Could not represent grammatical elements
- Over time, icons began to stand for the sounds in language
- Icons were reduced to strokes

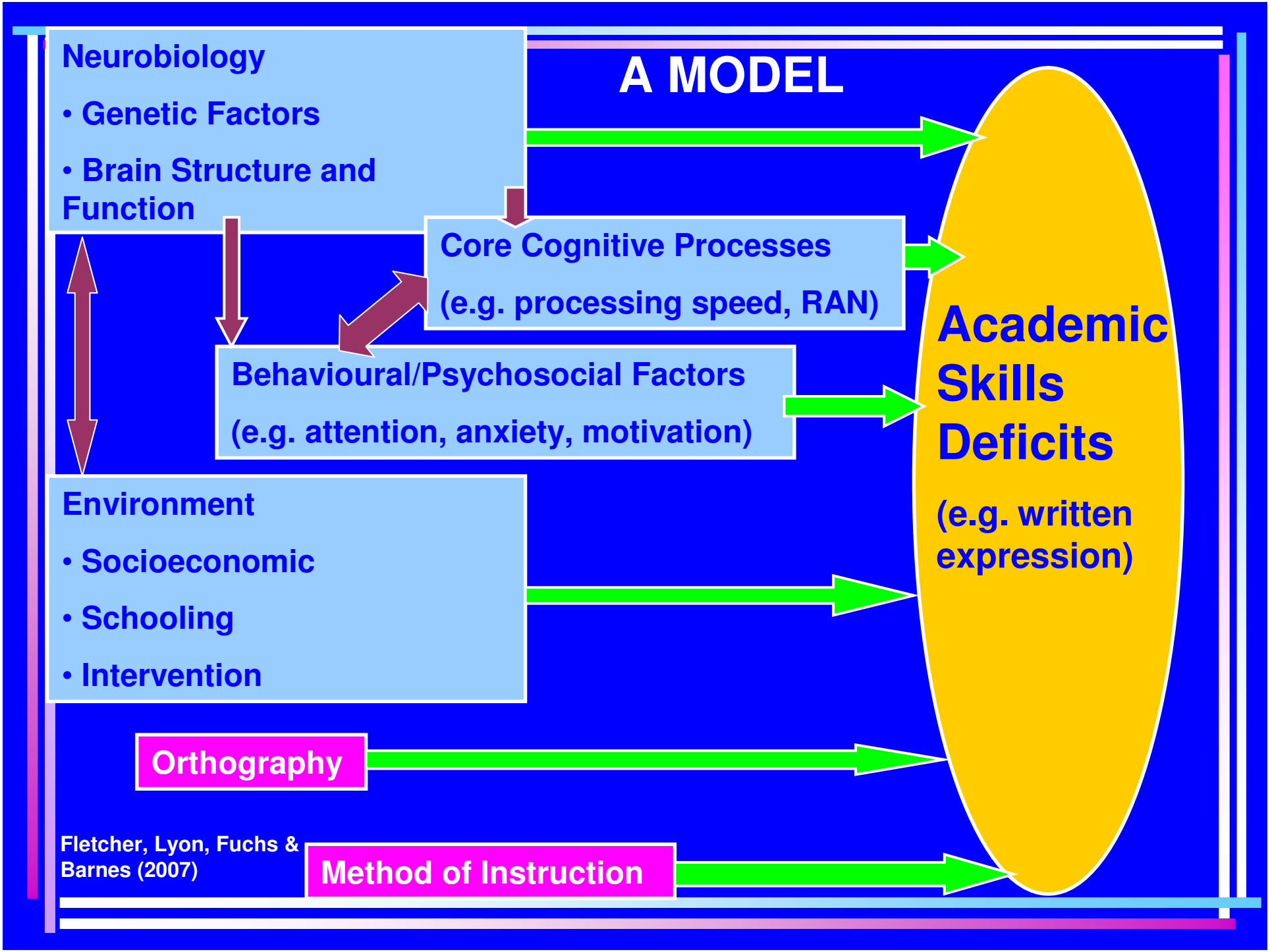
Historical Perspective

- Disorders involving the writing process have been discussed since 1867
  - Ogle used term "agraphia" for an acquired writing disorder
- Many dyslexics have difficulties with spelling and writing
- Some students have reasonable reading skill but weaknesses in writing

Why is writing difficult?

- The writing process is very complex
- It is the last language domain to develop in children
- In order to express thoughts in writing, one must:
  - Formulate the idea
  - Sequence relevant points in appropriate order
  - Ensure that the written output is syntactically and grammatically correct
  - Spell individual words correctly
  - Express the words, sentences, and passages in a legible manner via the graphomotor system

Defining and Diagnosing Dysgraphia


A MODEL
Neurobiology
• Genetic Factors
• Brain Structure and Function
Core Cognitive Processes
(e.g. processing speed, RAN)
Behavioural/Psychosocial Factors
(e.g. attention, anxiety, motivation)
Environment
• Socioeconomic
• Schooling
• Intervention
Orthography
Method of Instruction
Academic Skills Deficits
(e.g. written expression)
Fletcher, Lyon, Fuchs & Barnes (2007)

Curriculum Council Definition

- Students with a learning disability will have reading, written expression or mathematics skills significantly below expectation in relation to their present year level and/or cognitive ability. In most cases evidence of a processing impairment, frequently phonological in nature, will be present. Learning disabilities are presumed to be intrinsic to the individual and long term, but they are not considered to be the direct result of intellectual disability, physical disability, sensory impairment, or a primary emotional difficulty. Neither do they appear to derive directly from inadequate environmental experiences, or from the lack of an appropriate educational experience.

Specific Skills Disorders

Learning Disabilities provides a global label for a number of disorders of specific academic skills.

Both the DSM 1V (American Psychiatric Association) and the *International Classification of Diseases,* 10th Revision (ICD-10) have defined, classified and coded learning disorders and specific developmental disorders …

Eg. Written Expression Disorder (DSM 1V) and Specific Written Expression Disorder (ICD-10)

Developmental Dysgraphia

What is developmental dysgraphia?

- A specific learning disability in writing (or written expression disorder)
- Greek origin *"dys"* (poor / difficulty) *"graphus"* (writing)
- Difficulties learning to write that are unexpected in relation to a student's educational opportunities and relative to their chronological age and/or cognitive ability.

DSM-IV

- Disorder of Written Expression
- Writing skills that are substantially below those expected given the person's:
  - age
  - measured intelligence
  - age-appropriate education

Subtypes of Written Expression LDs

- A variety of language-based deficits in phonology and word retrieval could impair several aspects of the writing task
- So could deficits in visual-spatial skills and problems with executive functions (including organisation, planning and evaluating)

Subtypes of Written Expression LDs

- Four subtypes of writing disorder (Sandler et al 1992)
  1. Writing difficulties with both fine motor and linguistic deficits
  2. Writing difficulties with predominantly visual-spatial deficits
  3. Writing difficulties with attention and memory difficulties
  4. Writing difficulties characterised by sequencing problems
- First two subtypes more common

Characteristics of Dysgraphia

- Dysgraphia is an unexpected difficulty with handwriting and/or spelling that may occur alone or with Dyslexia
- Children with dysgraphia may:
  - Have illegible letter formation
  - Excessively slow, nonautomatic letter writing
  - Difficulties with spelling and written composition

Defining features of dysgraphia:

- Not specifically a motor problem
- Knowledge of orthography and planning ability also contribute to writing (and spelling) difficulties
- Coordination between orthographic knowledge, grapho-motor output and the executive functions involved in letter writing impact on dysgraphia

- Studies often do not separate children according to specific writing disabilities versus comorbidity with other SLDs
- Difficulty with definition
- Lag behind dyslexia and dyscalculia research

Experience what it's like to have difficulties with written expression

1. Listen to this short story
2. Remember the details so that you can summarise the story

But first,

- Write down:
  1. What you had for dinner last night
  2. What you did last Saturday night
  3. 16 x 42 = ?

- Now – summarise the story in your own words

Evaluate

- Content/Details
  - Captain James Brady
  - 1848 (or date in mid 1800s)
  - Colorado
  - Stopped for water (or) searching for water and/or mountain pass
  - Found gold
  - Got lost
  - Back to camp
  - Never found gold/stream/valley again
  - May still be undiscovered gold

Evaluate

- Order of events
- Spelling
- Punctuation
- Sentence/Paragraph structure

Clearly…

- Not all writing problems are due to Dysgraphia
- Other causes include concerns with:
  - Cognitive skills
  - Language
  - Motor skills
  - Attention and executive functioning
  - Socio-emotional functioning
  - Neurogenetic developmental disorder (e.g. Fragile X)
  - Illness or injury

The writing process:

- Transcription + generational = writing
- Transcription
  - Pr[illegible]tion of lette[illegible]
  - Ne[illegible]sary to translate ideas into a written pro[illegible]
- Generational
  - Translates ideas i[illegible] representations th[illegible] stored, and then retrieved from memory

Specific to the writing process

Applicable to many aspects of language and thought

Transcription constrains amount and quality of generation

- Research shows handwriting fluency and spelling can be used to predict compositional fluency and quality
- Across the age range, handwriting and spelling accounted for 41-66% of the variance in compositional fluency and 25-42 % of the variance in compositional quality

Prevalence

- Difficult to establish because many studies do not separate LDs
- Incidence rates in a sample of primary school aged children :
  - 1.3 to 2.7% for handwriting
  - 4% for spelling
  - 1-3% for written expression

(Berninger and Hart 1992)

Gender differences

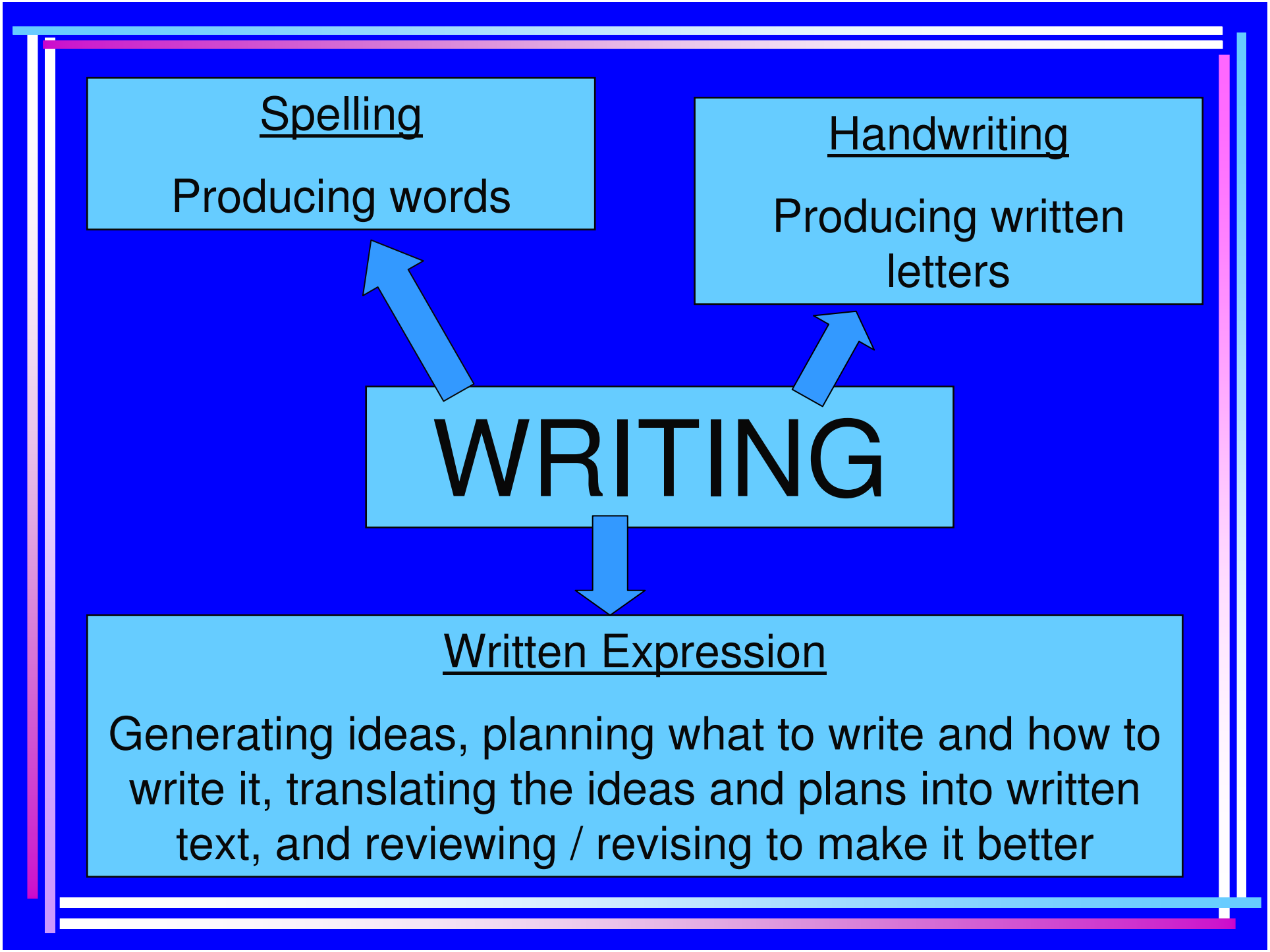
- Gender differences occur in writing rather than reading
- Boys tend to have more difficulties than girls in handwriting, spelling and executive functions for self-regulation of composing
- Girls are more likely to compensate for both reading and writing problems in their adult years

Heritability

- Few studies of heritability of handwriting disability
- Most involve spelling
- Spelling difficulties aggregate in families
- Twin studies show strong heritability of spelling abilities in twins (exceeded that found for reading)

What underlies dysgraphic difficulties?

- Functional neuroimaging studies show:
  - Components involved in fine motor control and language generation can be related to areas of the frontal lobes and the cerebellum
  - Areas involved in support of core processes that underlie writing including motor control and planning, executive functions and language
  - Why many children with ADHD have problems with writing


Spelling
Producing words
Handwriting
Producing written letters
WRITING
Written Expression
Generating ideas, planning what to write and how to write it, translating the ideas and plans into written text, and reviewing / revising to make it better

The complexity of the writing process suggests that …

- The various components of writing need to be explicitly taught; and,
- There are many areas where the process can 'break down'.
- Identifying the area of difficulty or underlying impairment is essential.

Handwriting may be impaired in:

- Legibility
  - How easily others can recognise their letters out of word context
- Automaticity
  - How many legible letters they can write in a limited time
- Speed
  - How much time it takes to complete a writing task

Handwriting

- A low-level mechanical skill…
- But – legible letter writing and automatic letter writing contribute uniquely to the amount and quality of written composition in Grades 1 to 6 (Graham et al. 1997)
- Explicit instruction in handwriting in the first two years of schooling may prevent more significant written composition problems in the later grades for all children

Handwriting and spelling difficulties can have a significant impact on written expression

- Result in misinterpretations of the author's meaning
- Create negative perceptions about the writer, which taint overall impressions about the quality of an essay
- Interfere with the execution of composing processes because cognitive resources are unduly allocated to the mechanical aspects of the process
- Lead students to avoid writing, which constrains writing development

Proper pencil grip

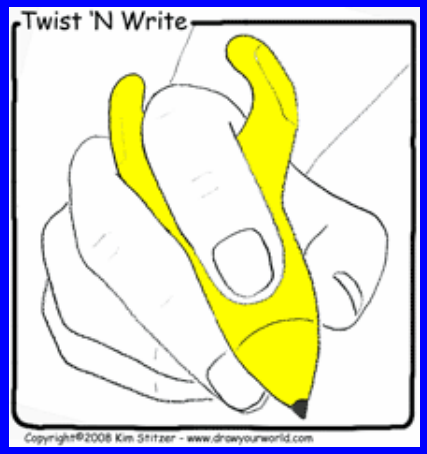
- Tripod grip with open web space is ideal
- Awkward pencil grip is more tiring and may affect letter formation and slant

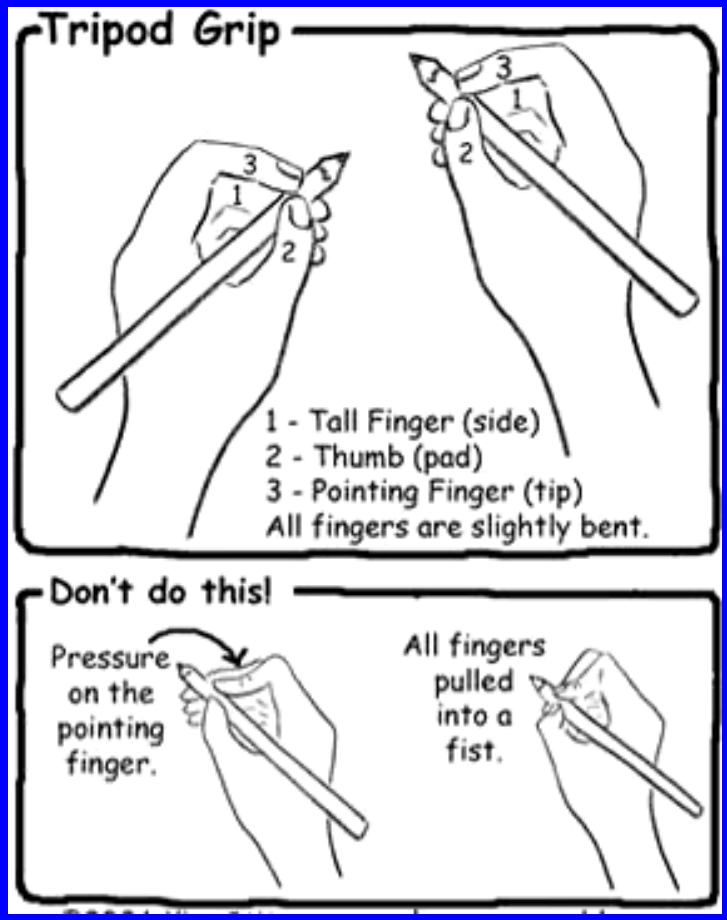
STOP – PINCH – LIFT

or

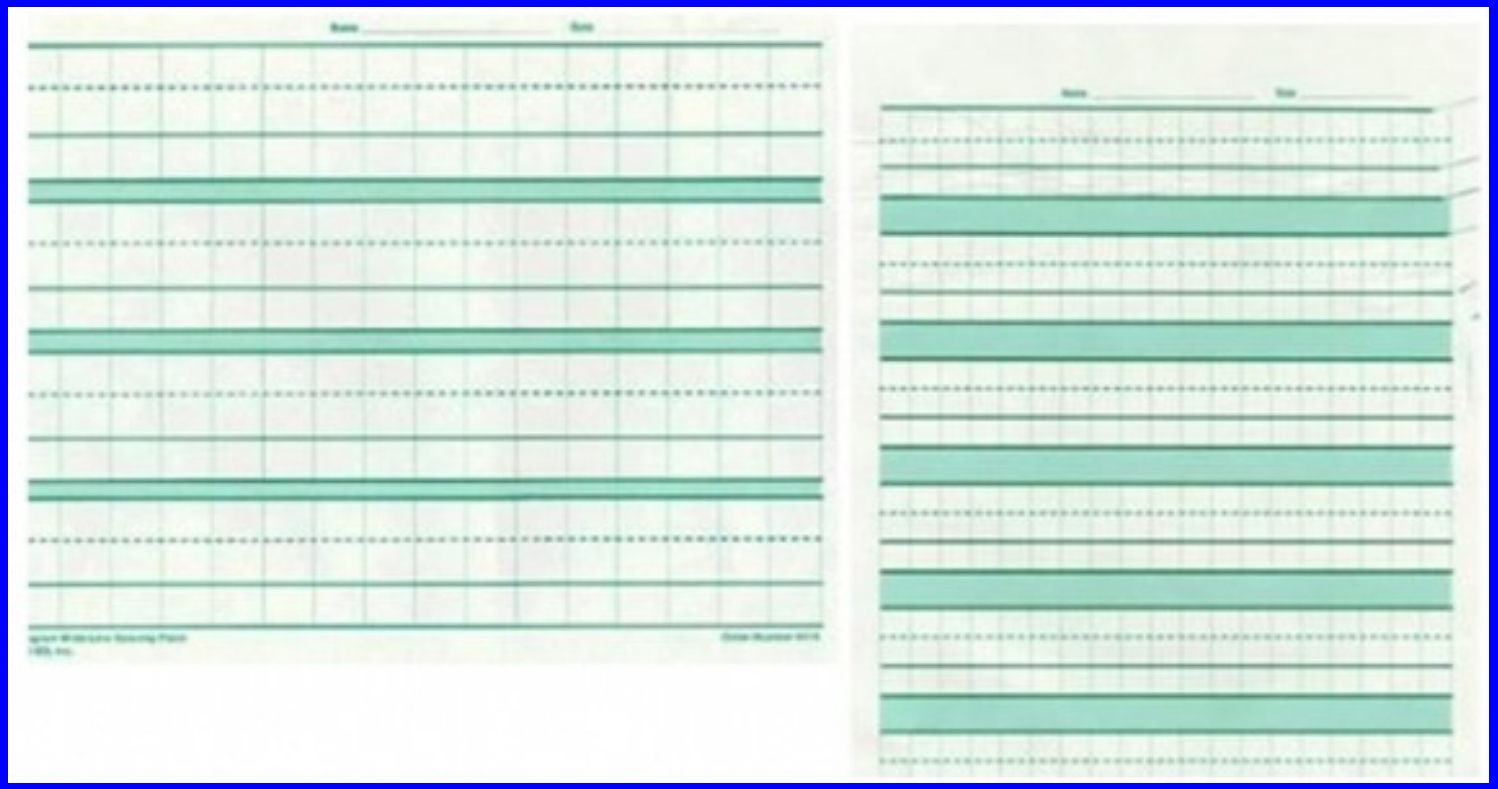
Froggy legs

skillbuilders.com.au have a good range





- While children write, they receive feedback in the form of pressure and the pull of the pencil against the paper
- Use a pencil with a soft lead to reduce fatigue
- No eraser



The Daily Lesson

- Build expectations for successful, automatic performance
- Check posture, paper position and pencil grip
- Name the letter while writing
- Write, then trace

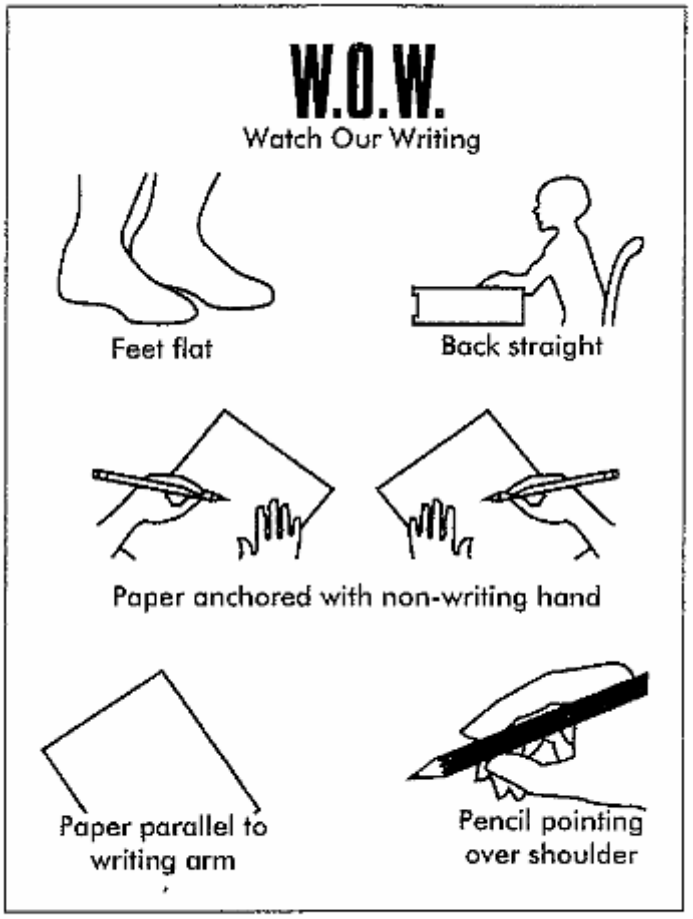


Figure 15.3. Watch Our Writing (W.O.W.) chart. (From Phelps, J., & Stempel, L. [1985]. *CHES's handwriting improvement program* [CHIP]. Dallas: Children's Handwriting Evaluation Scale; reprinted by permission.)

Keyboarding vs. Handwriting?

- Comprehensive assessment of severity of handwriting difficulty is needed
- Explicit instruction in keyboarding should be provided
- Typically developing children write more, write faster, write more complex syntax and express more ideas when writing by pen

Assistive Technologies to Support Handwriting Difficulties

- Getting the words down differently
  - Keyboarding skills – develop touch typing
    - *Nessy Fingers* is a touch-typing program that uses games to build up typing speed and accuracy. Other programs include *Easi Keysi* and *UltraKey.*
    - But, keep in mind, many students who have difficulty with the production of letters in a paper-and-pencil format also have difficulty with keyboarding
  - Voice to text software, e.g. *Dragon NaturallySpeaking*
    - All students (including those with LD) produce more material if they could dictate rather than write

Assistive Technologies to Support Handwriting Difficulties

- Supporting note-taking skills
  - Voice recording allows students to revise information they may not have written down
    - Digital recorder or device with a recording function (e.g. iPod, mobile phone)
    - *Pulse SmartPen* records and links audio to what you write, which can then be played back or uploaded onto your computer

Spelling

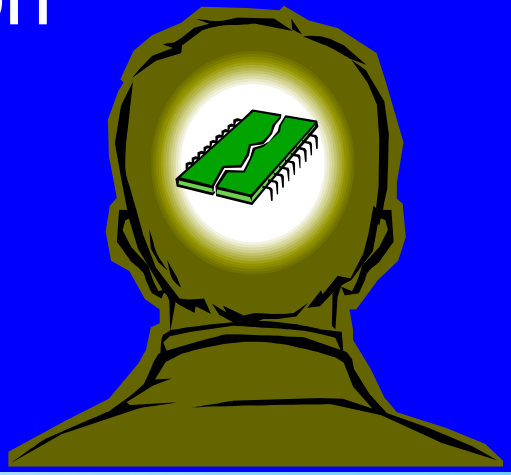
- Many students with writing disabilities also have a difficulty learning to spell
- WA research found:
  - Students with Dysgraphia tend to over-rely on visual and inadequate phonological strategies
  - Poor phoneme awareness and inefficient reading despite appearance of average reading in context

Assistive Technologies to Support Spelling Difficulties

- Hand-held spellcheckers, e.g. Collins Franklin Spellchecker with phonetic spell correction
- Software with inbuilt spellchecker, e.g. TextHELP
- Homophone support

Working Memory

- Children with dysgraphia may have reduced storage or processing capacity
- Weaknesses in working memory influence written expression



Composition

- Transcription and composition instruction should be taught in tandem to integrate the various writing components in resource-limited working memory
- Explicit instruction should be used for the high-level cognitive processes of composing

Planning

- Well-developed plans result in better first drafts
- Teachers who write well (and teach writing well) verbalise the process they use to help students develop "plans of action"

Build component skills

- Develop
  - Sentence structure
  - Paragraph structure
  - Essay/Report structure
- Explicitly teach structure of different writing tasks
- Demystify the writing process

Assistive Technologies to Support Written Expression Difficulties

- Word prediction software, e.g.TextHELP, Co:Writer, Kurzweil 3000, WordQ
- Written composition software, e.g. Draft:Builder, SOLO Writing Coach
- Speech to text / dictation with digital recorder

Assessing Dysgraphia

Diagnostic Criteria for Dysgraphia

- Unexpected underachievement in specific academic skill (eg. written expression, spelling) in relation to chronological age;
- Unexpected underachievement in specific academic skill in relation to cognitive ability;
- Uneven development of cognitive abilities;
- Evidence of ineffective, compensatory strategies;
- Processing weakness (eg. phonological processing (PA / PM / RAN); working memory; processing speed; visual processing);
- Failure to respond to prolonged, targetted intervention

Domains and Skills Assessed when identifying learning disabilities

- Cognitive Ability (VCI, PRI, WM, PS)
- Academic Achievement
  - Reading, Spelling, Written Expression, Numeracy skills
- Processing Skills
  - Phonological (include RAN); Visual
- Other
  - Receptive / Expressive Language, Attention, Behaviour, Executive Functioning

WISC-IV Subtests (the fine detail)

- Students with learning disabilities will often have an unusual (read variable) subtest profile: the Index scores provide an indication of cognitive strengths and weaknesses and the subtest results can, **at times**, suggest more specific indicators.

- The Working Memory Index and the Processing Speed Index scores are often implicated in learning disability (dyslexic / dysgraphic) profiles.

Specific Skills in Relation to Chronological Age / Cognitive Ability

- Reading
  - Accuracy, comprehension, rate, decoding skills
  - Timed and un-timed assessment data
- Spelling
  - Accuracy, compensatory strategies, spelling stage, real word and non-word
- Handwriting
  - Speed, competency, grip
- Written Expression
  - Output, conventions, legibility, spelling, fluency

Spelling Assessment

two purposes: diagnostic (clinical data) and qualitative (functional implications)

- WIAT II – spelling (real words)
- South Australian Spelling Test (revised)
- QUIL – nonword spelling

Written Expression Assessment … two purposes: diagnostic (clinical data) and qualitative (functional implications)

- Use appropriate writing conventions (letter formation, spelling, punctuation etc.)
- Use appropriate linguistic (syntax) forms (modifiers, question form, verb form etc.)
- Communicates meaningfully.
- Output is reasonable / completes task

Fluency: Students are considered to be fluent writers when they are able to write effortlessly, accurately, meaningfully and at a reasonable rate.

Written Expression Output

- Range of studies variously report written expression speeds in timed examinations as falling between 11 wpm and 15 wpm.
- Mean for girls > mean for boys
- 13.3 wpm v/s 11.9 wpm (Bishop & Esgate)
- WA study of 66 2nd year OT students – 2 hour exam / range 9.4 wpm to 23.2 wpm. Mean – 15.3 wpm.

Written Expression Assessment

- *Oral and Written Language Scales (OWLS)*
- *WIAT II*
- *CELF (R) – Framework*
- *Practitioner's own material*

Handwriting

- Handwriting Speed Test (3 minutes)
  - The quick brown fox jumps over the lazy dog.
- Observation – during assessment

The Handwriting Speed Test

Processing Skills

- Phonological Processing
- Visual Processing (generally checked by Developmental Optometrist)

Three Aspects of Phonological Processing

- Phonological memory
  - retrieval from long-term memory
  - Short term auditory (working) memory
- Phonological awareness
- RAN (Rapid Automised Naming)

Impaired Phonological Processing

- Research points overwhelmingly to a phonological deficit being the principal factor underlying reading and related written expression disabilities.
- The double-deficit hypothesis predicts an additive effect on reading such that the joint presence of phonological and naming deficits leads to worse performance than is predicted by a single deficit.

Source: Beaton, A.A. Dyslexia, Reading and the Brain – A sourcebook of Psychological and Biological Research, (2004), Psychology Press, New York

Tests used to assess aspects of Phonological Processing?

- CTOPP (Comprehensive Test of Phonological Processing)
- SPAT R (Sutherland Phonological Awareness Test) – Revised (ideal for students up to year 3 / 4)
- CELF-4 supplementary tests PA / RAN - (note: needs to be administered by Speech Pathologist or trained Psychologist)
- Queensland University Inventory of Literacy (QUIL) - (note: only normed to 13 years)
- TOWRE (non-words) (phonemic awareness only)
- Rosner TAAS (Test of Auditory Analysis) – (note: designed for very young children – unlikely to demonstrate impairment in older literate students)
- Numerous other

CTOPP Subtests

- Phonological Awareness
  - Elision (core)
  - Blending Words (core)
  - Blending nonwords (s)
  - Segmenting words (s)
  - Segmenting nonwords (s)
- Phonological Memory
  - Memory for digits (core)
  - Nonword repetition (core)
  - Phoneme reversal (s)
- Rapid Naming (RAN)
  - Rapid digit naming (c)
  - Rapid letter naming (c)
  - Rapid colour naming (s)
  - Rapid object naming (s)

Rapid Digit Naming

Rapid Colour Naming

Minimum Testing Required

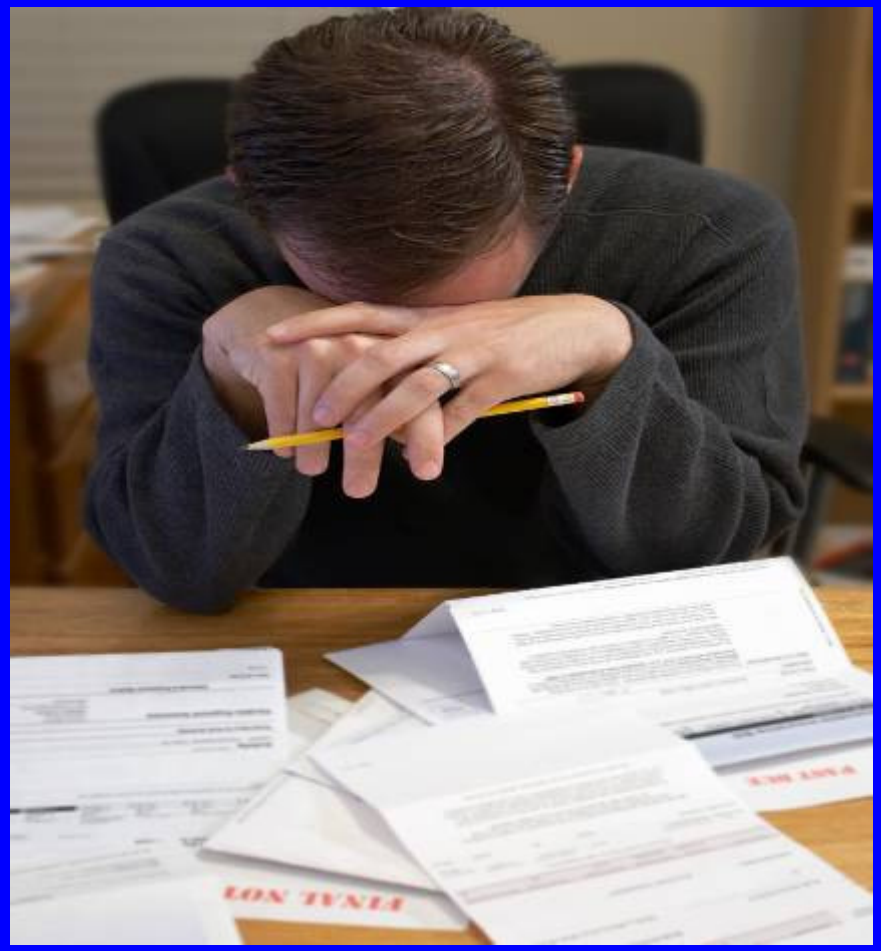
- Cognitive (WISC IV / WAIS IV)
- Biographical details / educational history including details of intervention
- Phonological Processing (CTOPP)
- Academic Skill
  - Reading (timed / un-timed);
  - Spelling (real word / non-word);
  - Written Expression

Case Examples

- All three of the following cases were assessed with dysgraphia ...

Functional Impact

- It is important to ascertain through the assessment process the level of functional impact (degree of disability).



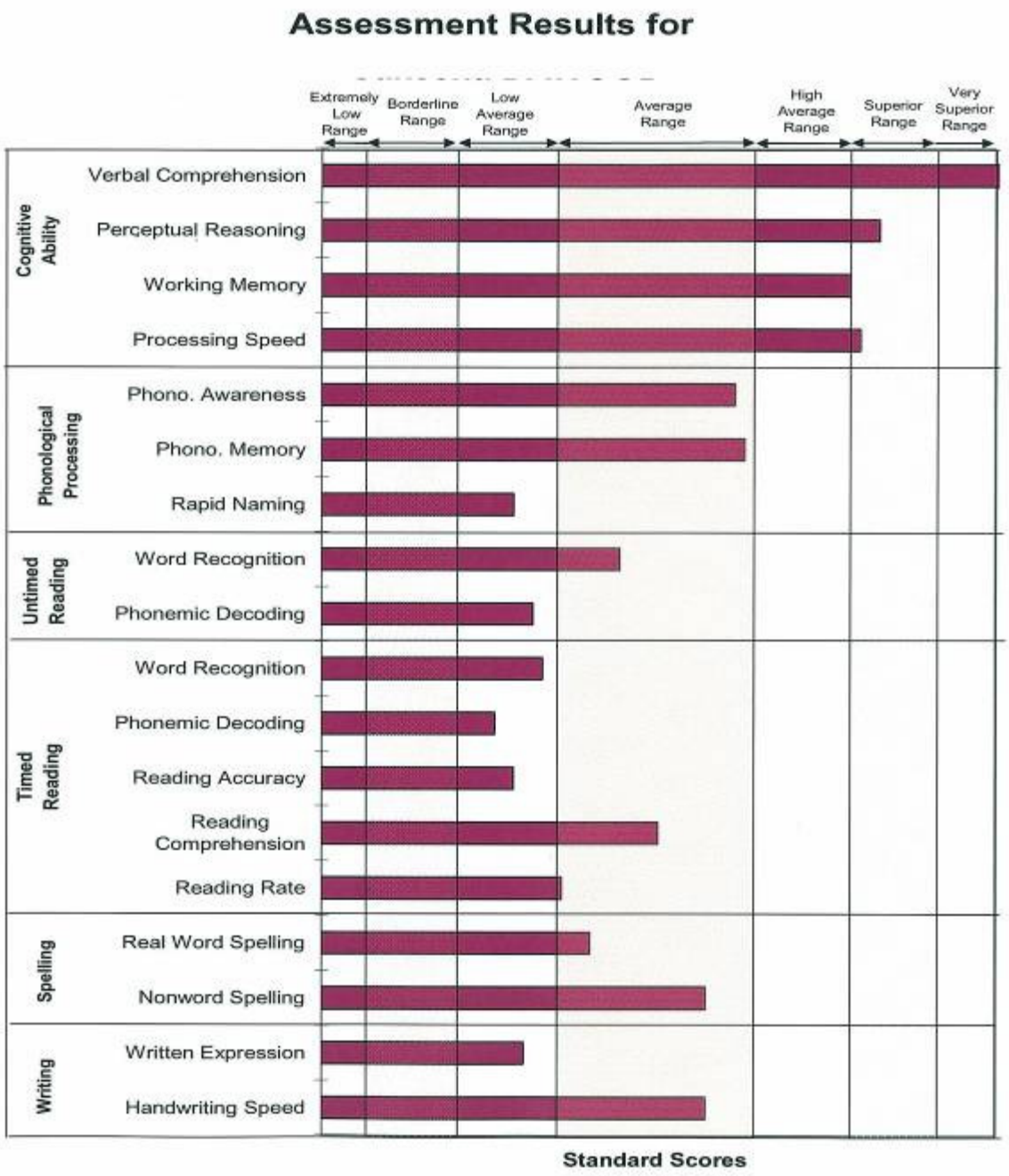
Case 1 – "Lilly"

- Born full term following a caesarean delivery
- Developmental motor milestones met early, although somewhat delayed speech
- Commenced school overseas and completed K, Pre-P, year 1 and year 2.
- Family relocated to Australia - Lilly placed into year 4 due to her age.
- Spelling difficulties noted since year 4. Mother reported that her Primary School teachers felt that she was disruptive and of lower intellectual ability.

- No support was provided at school. Her parents attempted to assist with phonics instruction at home, however, neither parent is a teacher.
- Upon commencement at secondary school, placed into academic extension classes for maths and science.
- Began to have frequent absences at school due to headaches, backaches, stress and anxiety.
- Has had intervention from a Psychologist for depression.

- Lilly was assessed in 2010 by Dr Tom Jones (Psychologist). Lilly's general intellectual ability fell within the Very Superior range (percentile rank = 99).
- A significant difference was noted between her Very Superior VCI (Percentile Rank = 99) and her Superior PRI (Percentile Rank = 94).
- A significant relative weakness was noted in her WMI (Percentile Rank = 91) when compared to her exceptional Verbal reasoning skills.
- Her reading and spelling skills were significantly below the level expected when considering her very strong verbal reasoning skills.

Cognitive Ability	VCI – 99	PRI - 94
	WMI - 91	PSI - 92
Phonological Processing	PA – 79 Alt PA - 58	PM – 73 RAN – 16 / Alt RAN - 8
Reading Comp	Accuracy = PR 16 Fluency = PR 16 Comprehension = PR 50	**Difficulties noted** in Lilly's ability to read brief passages of text. Her overall reading rate is low and she is not a fluent reader. Mistakes consistent with using visual strategies.
Reading	Real Words /Untimed PR - 39	Real Words / timed PR - 21
	Psuedowords PR – 19 (untimed)	Psuedowords PR – 13 (timed)
Spelling	Real Words – PR 18	Non Words - Average
Written Expression	Low Average – PR 18	Output – app 10 wpm
HWST	141 lpm / average	**handwriting legibility was very poor**. Lilly reported hand soreness after only 5 minutes of writing.


Assessment Results for
Extremely Low Range
Borderline Range
Low Average Range
Average Range
High Average Range
Superior Range
Very Superior Range
Cognitive Ability
Verbal Comprehension
Perceptual Reasoning
Working Memory
Processing Speed
Phonological Processing
Phono. Awareness
Phono. Memory
Rapid Naming
Untimed Reading
Word Recognition
Phonemic Decoding
Timed Reading
Word Recognition
Phonemic Decoding
Reading Accuracy
Reading Comprehension
Reading Rate
Spelling
Real Word Spelling
Nonword Spelling
Writing
Written Expression
Handwriting Speed
Standard Scores

is fear is some what or
end visits the ~~the~~ woman an
dom. In this passage of The Ora
issues is fear, the power o
understate to abolish fear, ar
as well as serious the
nship, wisdom, abandonme
rational intention, various
extract from The Orchard
with rational tensions, sho
form of considering the
science. "Surely," I said "in thi
is irrational, and cannot be
sional people know that
ll not happen, does not m
an happen whether you wa
technique that illustrates this
On the other hand there wa
e. Irrational illustrates
person view of this sect
ed well to help the rea
fear this woman faced.
ddresses us directly, abou
e. "I was besieged with

Case 2 – "Jenny"

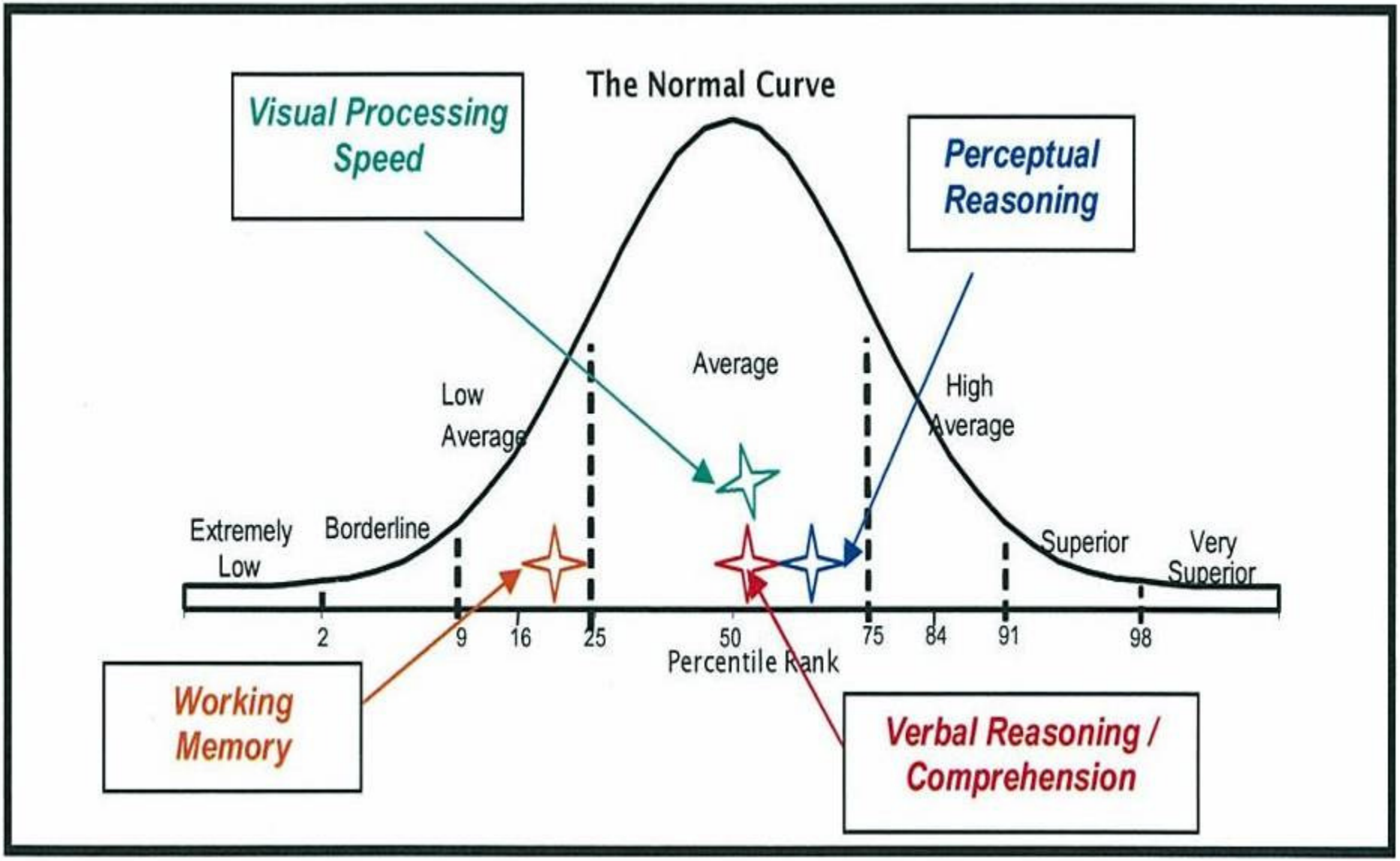
- Jenny was referred by her family due to concerns regarding the length of time that she was taking to complete her examinations. An updated assessment was requested to confirm Jenny's diagnosis of Dyslexia and support an application for the provision of additional working time in the WACE examinations.

- Jenny was assessed by a Psychologist in November 2004. The report noted that Jenny had early stuttering and late language development. Jenny was identified with information processing difficulties that included long-term memory of facts, knowledge of the meanings of words, short-term auditory memory, working memory and phonemic awareness. Jenny was significantly underachieving in spelling, reading accuracy, reading non-words, reading comprehension and written expression. Jenny was diagnosed with Dyslexia.

- There is a strong maternal and paternal family history of dyslexia.

- *Educational History*
  - Jenny's teachers identified difficulties in Year 2 and she has continued to have literacy difficulties throughout her schooling.
  - Jenny was provided with additional support and remedial intervention through primary school
  - Her parents report continued difficulties in reading, spelling, writing, short-term memory, language and organisation.
  - Jenny is noted to be working very hard this year and she spends a considerable amount of time studying.
- School has trialled extra time in tests this term and teachers have indicated that this assists Jenny with her achievement.

SKILL	SUBTESTS	RESULT
Verbal Comprehension (VCI)	Similarities, Vocabulary, Information, (Comprehension)	Average range Percentile Rank = 55
Perceptual Reasoning (PRI)	Block Design, Matrix Reasoning, Visual Puzzles, (Figure Weights), (Picture Completion)	Average range Percentile Rank = 63
Working Memory (WMI)	Digit Span, Arithmetic, (Letter-Number Sequence)	Low Average range Percentile Rank = 23
Processing Speed (PSI)	Symbol Search, Coding, (Cancellation)	Average range Percentile Rank = 50
General Ability Index (GAI)	Verbal Comprehension and Perceptual Reasoning	Average range Percentile Rank = 58


The Normal Curve
Visual Processing Speed
Perceptual Reasoning
Working Memory
Verbal Reasoning / Comprehension
Extremely Low
Borderline
Low Average
Average
High Average
Superior
Very Superior
2
9
16
25
50
75
84
91
98
Percentile Rank

SKILL	SUBTEST	RESULT
Alternate Phonological Awareness	Blending Nonwords	Below Average range Percentile Rank = 16
	Segmenting Nonwords	Very Poor range Percentile Rank = <1
	Phoneme Reversal	Below Average range Percentile Rank = 16
Phonological Memory	Memory for Digits	Average range Percentile Rank = 63
	Nonword repetition	Below Average range Percentile rank = 9
Rapid Automatised Naming	Rapid Letter Naming, Rapid Number Naming	Poor range Percentile Rank = 8
Alternate Rapid Automatised Naming	Rapid Letter Naming, Rapid Number Naming	Below Average range Percentile Rank = 12

SPELLING ASSESSMENT

(For use with WIAT-II, SAST or QUIL Spelling Subtests)

dworf	x	betleform	x
lont	✓	sockderpow	x
sheev	✓	elenn	x
womp	x	cleppering	✓
suts	✓	chetlecede	x
crad	x	comlifastion	x
strecher	x	shepolarto	x
pitfair	✓	disapillshin	x
truckowl	x	dramplehoffer	✓
batel	x	stimperdiction	x
~~deadly~~ clodly	✓		
desond	x		
tosmufid	x		
strapperbees	x		

SAST

Raw Score:	
Average:	
Critical Score:	
Spelling Age:	

QUIL / WIAT-II/ DST

Raw Score:	7
Scaled Score:	5
Percentile Rank:	5%
At Risk Factor:	

SKILL		TEST	RESULT
Spelling – Real Words	**UNTIMED**	WIAT-II – Spelling	Below Average/Average range Percentile Rank = 25
Spelling – Nonsense Words	**UNTIMED**	Queensland University Inventory of Literacy (QUIL) – Non-word spelling Test	Well Below Average range Percentile Rank = 5

SKILL		TEST	RESULT
Reading – Real Words	**UNTIMED**	Wechsler Individual Achievement Test, Second Edition (WIAT-II) - Word Reading	Well Below Average/Below Average range Percentile Rank = 8
Reading – Real words	**TIMED**	Test of Word Reading Efficiency (TOWRE) – Sight Word Efficiency	Below Average range Percentile Rank = 13

SKILL		TEST	RESULT
Written Expression – Unstructured	**TIMED**	WIAT – II – Written Expression subtest	Below Average range Percentile Rank = 16

I believe ~~the~~ physical education should be given in all schools for at least 30 minutes per day. Australia has one of the highest levels of obesity which is ~~rapidly~~ being faced by many your children. 30 minutes of exercise per day would reduced our obesity levels in children significantly. Obesity can also result in a high risk of diseases such as diabetes and heart attacks. If children were to exercise more, it would reduce their risk of developing these diseases. ~~and would~~ also reduce ~~the risk of~~ future general Physical Education is fun for kids. It gives them a good social environment where they are more likely to have

Case 3 - "Henry"

Henry was referred by the school psychologist due to concerns with spelling and written expression. Henry experienced a few bouts of otitis media prior to three years of age and results of hearing and auditory processing assessments indicated he had normal hearing although he was found to have an auditory processing disorder, particularly when dealing with background noise. A vision assessment (at 8 yrs) suggested a lack of eye preference and some difficulties with visual tracking.

Henry was reported to be performing below his peers during primary school. He participated in small group and one to one educational support twice a week focussing on literacy, motor-coordination, and relaxation.
James was assessed by a speech pathologist and his results indicated he had strengths in comprehension, semantics, syntactic skills, and pragmatics. He also presented with a mild delay in narrative skills and phonological awareness, as well as disordered representation of some sounds.
There is a history of learning difficulties in Henry's family.

Cognitive Ability	VCI – 79	PRI - 30
	WMI - 42	PSI - 16
Phonological Processing	PA – 84 Alt PA - 25	PM – 27 RAN – 27
Reading Comp	Rate = PR 25 Accuracy = PR 9 Fluency = PR 5 Comprehension = PR 50	**Difficulties noted** Henry's reading skills deteriorated further when he was asked to read in an applied manner. His overall reading skills are not fluent.
Reading	Real Words /Untimed PR - 37	Real Words / timed PR - 21
	Psuedowords PR – 25 (untimed)	Psuedowords PR – 23 (timed)
Spelling	Real Words – PR 9	Non Words – PR 5
Written Expression	Low Average – PR 19	Output – app 10 wpm
HWST	70 lpm / borderline PR 1	**handwriting legibility was very poor**. Henry reported experiencing pain in his wrist throughout the handwriting tasks.

Henry, aged 14 yr 0 m

25. Write one sentence using these four words: **have my not here**

Put
Have my present here, not their (sp) I argued. (P)

I am copying a short passage to check my speed of transcription. I have one minute to complete as much as I can. It is important to work quickly but accurately, so that my handwriting is legible.

I am copying a short passage to check my speed of transcription. I have one minute to complete as much as I can. It is

can use the scrap paper for a rough draft if you ... correct spelling and punctuation is important. No Greeting

I am writing a letter to say that I think physical education is important to school life. It is a change from the time we spend being trapped down in a desk, a break from school work. Also as boys are changing rapidly (P) they prefer to be running around and being active. 5s

Also it is a (sp) chance for boys ta (sp) excell at sports, and it gives them chances to shine outside the classroom. Every boys potential (sp) should be able to show itself both outside the classroom and inside. 34

Boys enjoy being active and stretching their legs (P) If you ask people I believe you will find most people prefer double sport than double Math (C) 24

Boys (sp) deserve to do (sp) what they want to do, (P) Getting out of the class room is important and every boy deserves a chance to shine. Also boys prefer PE to/above them most other subjects. 3

In Reports to Curriculum Council

- Try to keep your report brief and to the point
- Identify SLD and state diagnosis explicitly
- Summarise findings
  - Cognitive / intra-individual differences
  - Identify processing impairment
  - Demonstrate academic skill deficits
- Outline functional impact
  - Candidates whose capacity to participate in a timed assessment is adversely affected in a significant way by an SLD may be eligible to access appropriate, fair and reasonable alternative arrangements

A feel good story

http://www.youtube.com/watch?v=1ygzz0V6CmM

References

- Aaron, P.G., Joshi, R.M. & Quatroche, D. (2008). *Becoming a Professional Reading Teacher.* Maryland: Paul H. Brookes.
- Berninger, V.W. & Richards, T. (2010). Inter-relationships among behavioural markers, genes, brain and treatment in dyslexia and dysgraphia. *Future Neurology*. 5, 597-617.
- Berninger, V.W. & Wolf B.J. (2009). *Teaching Students with Dyslexia and Dysgraphia: Lessons from Teaching and Science.* Maryland: Paul H. Brookes.
- Birsh, J.R. (2005). *Multisensory Teaching of Basic Language Skills.* Maryland: Paul H. Brookes.
- Carreker, S. & Birsh, J.R. (2005). *Multisensory Teaching of Basic Language Skills: Activity Book.* Maryland: Paul H. Brookes.
- Fletcher, Lyon, Fuchs & Barnes (2007). *Learning Disabilities: From identification to Intervention*. New York: Guilford Press.

Thank you!